











# Programme of the 11<sup>th</sup> Karlsruhe International School on Fusion Technologies






**Monday 04/09/2017**

9:00-9:15	Opening of the summer school, organisational matters	M. Ionescu Bujor	
<b>Topic 1: Introduction to fusion</b>			
9:15-10:15	Future energy and the role for fusion	R. Kemp	
10:15-11:15	Fusion and the characteristics of fusion power plants	R. Kemp	
11:15-11:30	coffee break		
11:30-12:15	Basic physics of a tokamak	R. Kemp	
<b>Topic 2: The fuel cycle of a fusion reactor</b>			
13:30-15:15	Tritium handling + tritium plant of a fusion reactor	L. Frances	
15:15-15:30	coffee break		
15:30-16:15	ITER fuelling system	S. Maruyama	






**Tuesday 05/09/2017**

<b>Topic 2: The fuel cycle of a fusion reactor</b>			
9:00-10:30	Visit to TLK	L. Frances	
10:30-10:45	coffee break		
10:45-12:30	Vacuum pumping systems and DEMO inner fuel cycle	C. Day	
<b>Topic 3: Plasma physics</b>			
13:30-14:30	Introduction to plasma physics (I)	B. Pégourié	
14:30-14:45	coffee break		
14:45-16:00	Introduction to plasma physics (II)	B. Pégourié	

**Wednesday 06/09/2017**







<b>Topic 4: Blankets</b>			
09:00-10:30	Basics of breeding blanket technology	F. Cismondi	
10:30-10:45	coffee break		
10:45-12:30	Solid breeder blanket	F. Cismondi	
13:15-14:30	Liquid metal blanket	I. Ricapito	
14:30-15:15	Breeder materials	M. Kolb	
15:15-15:30	coffee break		
15:30-16:30	Magnetohydrodynamics of liquid metals	L. Bühler	

**Thursday 07/09/2017**

<b>Topic 5: Divertors</b>			
9:00-10:00	Divertors	B. Ghidersa	
10:00-11:00	Manufacturing processes for High Heat Flux Components	E. Visca	
11:00-11:15	coffee break		
<b>Topic 6: Cooling aspects</b>			
11:15-12:15	Cryogenics	R. Lietzow	
14:00-15:15	Water cooled plasma facing components	R. Mitteau	
15:15-15:30	coffee break		
15:30-16:30	Visit to HELOKA facilities	A. Kunze	

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**Friday 08/09/2017**

<b>Topic 7: Safety, socioeconomics and waste</b>			
9:00-10:00	Introduction to the ITER Safety Programme	P. Wouters	
10:00-11:00	General safety analysis approach and techniques	L. Di Pace	
11:00-11:15	coffee break		
11:15-12:30	Structural analysis and tests for nuclear licensing of fusion reactor	D. Combescure	
<b>Topic 8: Materials development for fusion reactors</b>			
13:15-14:00	Structure and texture of metallic solids	M. Rieth	
14:00-14:45	High temperature materials	M. Rieth	
14:45-15:00	coffee break		
15:00-16:30	Presentation of the Fusion Materials Laboratory (FML)/ Visit to FML	H.-C. Schneider/ S. Antusch	




**Sunday 10/09/2017**

Excursion to Speyer  
11:30-22:00







registration required



**Monday 11/09/2017**






<b>Topic 9: Neutronics and activation analysis</b>			
9:00-10:30	Fusion neutronics - methods, data, applications I	U. Fischer	
10:30-10:45	coffee break		
10:45-12:15	Fusion neutronics - methods, data, applications II	U. Fischer	
<b>Topic 10: Remote handling, maintenance scheme</b>			
13:30-15:00	Remote handling maintenance scheme	E. Villedieu	
15:00-15:15	coffee break		
15:15-16:15	Poster Session		

**Tuesday 12/09/2017**







<b>Topic 10: Remote handling, maintenance scheme</b>			
9:00-9:45	Assembling of Tokamak components	T. Mull	
9:45-10:30	Availability considerations for future fusion power plants	T. Mull	
10:30-10:45	coffee break		
<b>Topic 11: Technology of magnetic confinement</b>			
10:45-12:15	Superconductivity and magnet technology	W. Fietz	
12:15-13:00	Structural materials at cryogenic temperatures	K.-P. Weiss	
14:00-15:30	High temperature superconductivity	M. Wolf	
15:30-15:45	coffee break		
15:45-16:30	Manufacturing of superconducting magnets	E. Theisen	

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
**Wednesday 13/09/2017**

Topic 11: Technology of magnetic confinement			
9:00-10:30	Visit to TOSKA + CryoMaK	W. Fietz/K.Weiss	
Topic 12: Plasma heating technology and plasma diagnostics			
10:30-12:00	Gyrotrons	S. Illy	
12:00-13:00	ECRH upper port plugs and diamond window technology	T. Scherer	
14:00-15:00	Plasma diagnostics in fusion devices	S. Hacquin	
15:00-16:30	Visit of Gyrotrons	M. Schmid	

**Thursday 14/09/2017**

Topic: Plasma heating technology and plasma diagnostics			
9:00-9:45	Introduction to neutral beam injection technology	I. Day	
Topic 13: Operating and planned facilities			
9:45-10:30	JET	I. Day	
10:30-11:15	DEMO and the route to fusion power (part 1)	I. Jenkins	
11:15-11:30	coffee break		
11:30-12:30	DEMO and the route to fusion power (part 2)	I. Jenkins	
13:30-15:00	Wendelstein 7-X	R. Wolf	
15:00-15:15	coffee break		
15:15-16:45	ITER	R. Raffray	

**Friday 15/09/2017**

Topic 13: Operating and planned facilities			
9:00-10:00	Tore Supra and the WEST project	J. Bucalossi	
10:00-11:00	JT-60SA	J. Bucalossi	
11:00-11:15	coffee break		
11:15-12:15	ASDEX upgrade	W. Suttrop	
12:15-12:30	Final discussion, hand-out of certificates	M. Ionescu Bujor	